

CLAIMS

1. An image generation method, comprising:

providing initial object images each having a coefficient of semi-transparency and an assigned distance from a virtual viewpoint, ones of the initial object images to be subjected to predetermined image processing; and

subjecting the ones of the initial object images to the predetermined image processing to produce resultant object images based on the coefficients of semi-transparency and the assigned distances from the virtual viewpoint so that the initial object image having an assigned distance closest to the virtual viewpoint is processed last.

2. The image generation method according to Claim 1, wherein the predetermined image processing is a process for converting the ones of the initial object images into semi-transparent object images depending on the coefficients of semi-transparency.

3. An image generation method, comprising:

providing a first frame image storage area and a second frame image storage area;

providing initial object images each having a coefficient of semi-transparency and an assigned distance from a virtual viewpoint, ones of the initial object images to be subjected to predetermined image processing;

subjecting the ones of the initial object images to the predetermined image processing to produce resultant object images;

subjecting the resultant object images to predetermined comparison processing based on the assigned distances from the virtual viewpoint to produce compared object images, and drawing the compared object images in the first frame image storage area without storing assigned distances of the compared object images from the virtual viewpoint;

separately subjecting the ones of the initial object images to the predetermined comparison processing but not to the predetermined image processing to produce compared initial object images, and drawing the compared initial object images in the second frame image storage area while storing assigned distances of the compared initial object images from the virtual viewpoint;

subjecting the compared initial object images stored in the second frame image storage area to the predetermined image processing without being followed by the predetermined comparison processing to produce processed images; and

combining the processed images with the compared object images previously stored in the first frame image storage area to produce synthesized images.

4. The image generation method according to Claim 3, wherein the predetermined comparison processing is a process for comparing Z coordinate values expressing the assigned distances from the virtual viewpoint of a first group of pixels composing the object images and a second group of

pixels composing the object images, the pixels in the first group of pixels each having first X-Y coordinate values in a two-dimensional plane, and the pixels in the second group of pixels each having second X-Y coordinate values in the two-dimensional plane which are identical to the first X-Y coordinate values, for each X-Y coordinate value the predetermined comparison processing retaining only the pixel having a Z coordinate value closest to the virtual viewpoint, and omitting the pixel having a Z coordinate value which is not closest to the virtual viewpoint.

5. An image generation method, comprising:

providing a first frame image storage area and a second frame image storage area;

providing initial object images each having a coefficient of semi-transparency and an assigned distance from a virtual viewpoint, ones of the initial object images to be subjected to predetermined image processing;

subjecting other ones of the initial object images not to be subjected to the predetermined image processing to predetermined comparison processing based on the assigned distances from the virtual viewpoint to produce first compared object images, and drawing the first compared object images in the first frame image storage area while storing assigned distances of the first compared object images from the virtual viewpoint;

subjecting the ones of the initial object images to the predetermined image processing to produce

resultant object images;

subjecting the resultant object images to the predetermined comparison processing to produce second compared object images, and then combining in the first frame image storage area the second compared object images with the first compared object images to produce first frame images without storing assigned distances of the first frame images from the virtual viewpoint;

separately subjecting the ones of the initial object images to the predetermined comparative processing but not to the predetermined image processing to produce compared initial object images, and then drawing the compared initial object images in the second frame image storage area while storing assigned distances of the compared initial object images from the virtual viewpoint;

subjecting the compared initial object images stored in the second frame image storage area to the predetermined image processing without being followed by the predetermined comparison processing to produce processed images; and

combining the processed images with the first frame images previously stored in the first frame image storage area to produce synthesized images.

6. The image generation method according to Claim 5, wherein the predetermined comparison processing is a process for comparing Z coordinate values expressing the assigned distances from the virtual viewpoint of a first group

of pixels composing the object images and a second group of pixels composing the object images, the pixels in the first group of pixels each having first X-Y coordinate values in a two-dimensional plane, and the pixels in the second group of pixels each having second X-Y coordinate values in the two-dimensional plane which are identical to the first X-Y coordinate values, for each X-Y coordinate value the predetermined comparison processing retaining only the pixel having a Z coordinate value closest to the virtual viewpoint, and omitting the pixel having a Z coordinate value which is not closest to the virtual viewpoint.

7. An image generation device, comprising:

an image processing unit operable to subject a first group of initial object images to predetermined image processing to produce resultant object images based on predetermined coefficients of semi-transparency and assigned distances from a virtual viewpoint so that the initial object image having an assigned distance closest to the virtual viewpoint is processed last.

8. The image generation device according to Claim 7, wherein the image processing unit performs, as the predetermined image processing, a process for converting the first group of initial object images into semi-transparent object images depending on the coefficients of semi-transparency.

9. An image generation device, comprising:

a first frame image storage area and a second

frame image storage area; and

an image processing unit operable to

(i) subject a first group of initial object images to predetermined image processing to produce resultant object images;

(ii) subject the resultant object images to predetermined comparison processing based on assigned distances from a virtual viewpoint to produce compared object image, and draw the compared object images in the first frame image storage area without storing assigned distances of the compared object images from the virtual viewpoint;

(iii) separately subject the first group of initial object images to the predetermined comparison processing but not to the predetermined image processing to produce compared initial object images; and draw the compared initial object images in the second frame image storage area while storing assigned distances of the compared initial object images from the virtual viewpoint;

(iv) subject the compared initial object images stored in the second frame image storage area to the predetermined image processing without being followed by the predetermined comparison processing to produce processed images; and

(v) combine the processed images with the compared object images previously stored in the first frame image storage area to produce synthesized images.

10. The image generation device according to Claim 9, wherein the image processing unit performs, as the predetermined comparison processing, a process for comparing Z coordinate values expressing the assigned distances from the virtual viewpoint of a first group of pixels composing the object images and a second group of pixels composing the object images, the pixels in the first group of pixels each having first X-Y coordinate values in a two-dimensional plane, and the pixels in the second group of pixels each having second X-Y coordinate values in the two-dimensional plane which are identical to the first X-Y coordinate values, for each X-Y coordinate value the predetermined comparison processing retaining only the pixel having a Z coordinate value closest to the virtual viewpoint, and omitting the pixel having a Z coordinate value which is not closest to the virtual viewpoint.

11. An image generation device for processing initial object images each having a coefficient of semi-transparency and an assigned distance from a virtual viewpoint, ones of the initial object images to be subjected to predetermined image processing, the image generation device comprising:

a first frame image storage area and a second frame image storage area; and

an image processing unit operable to

(i) subject other ones of the initial object images not to be subjected to the predetermined image

processing to predetermined comparison processing based on the assigned distances from the virtual viewpoint to produce first compared object images, and draw the first compared object images in the first frame image storage area while storing assigned distances of the first compared object images from the virtual viewpoint;

(ii) subject the ones of the initial object images to the predetermined image processing to produce resultant object images;

(iii) subject the resultant object images to the predetermined comparison processing to produce second compared object images, and then combine in the first frame image storage area the second compared object images with the first compared object images to produce first frame images without storing assigned distances of the first frame images from the virtual viewpoint;

(iv) separately subject the ones of the initial object images to the predetermined comparative processing but not to the predetermined image processing to produce compared initial object images, and draw the compared initial object images in the second frame image storage area while storing assigned distances of the compared initial object images from the virtual viewpoint;

(v) subject the compared initial object images stored in the second frame image storage area to the predetermined image processing without being followed by the predetermined comparison processing to produce processed

images; and

(vi) combine the processed images with the first frame images previously stored in the first frame image storage area to produce synthesized images.

12. The image generation device according to Claim 11, wherein the image processing unit performs, as the predetermined comparison processing, a process for comparing Z coordinate values expressing the assigned distances from the virtual viewpoint of a first group of pixels composing the object images and a second group of pixels composing the object images, the pixels in the first group of pixels each having first X-Y coordinate values in a two-dimensional plane, and the pixels in the second group of pixels each having second X-Y coordinate values in the two-dimensional plane which are identical to the first X-Y coordinate values, for each X-Y coordinate value the predetermined comparison processing retaining only the pixel having a Z coordinate value closest to the virtual viewpoint, and omitting the pixel having a Z coordinate value which is not closest to the virtual viewpoint.

13. A computer-readable recording medium having recorded thereon an image processing program to be executed on a computer, the image processing program for processing initial object images each having a coefficient of semi-transparency and an assigned distance from a virtual viewpoint, the image processing program comprising:

subjecting ones of the initial object images

to predetermined image processing to produce resultant object images based on the coefficients of semi-transparency and the assigned distances from the virtual viewpoint so that the initial object image having an assigned distance closest to the virtual viewpoint is processed last.

14. The computer-readable recording medium according to Claim 13, wherein the image processing program performs, as the predetermined image processing, a process for converting the ones of the initial object images into semi-transparent object images depending on the coefficients of semi-transparency.

15. A computer-readable recording medium having recorded thereon an image processing program to be executed on a computer, the image processing program utilizing a first frame image storage area and a second frame image storage area for processing initial object images each having a coefficient of semi-transparency and an assigned distance from a virtual viewpoint, the image processing program comprising:

subjecting ones of the initial object images to predetermined image processing to produce resultant object images;

subjecting the resultant object images to predetermined comparison processing based on the assigned distances from the virtual viewpoint to produce compared object images, and drawing the compared object images in the first frame image storage area without storing assigned

distances of the compared object images from the virtual viewpoint;

separately subjecting the ones of the initial object images to the predetermined comparison processing but not to the predetermined image processing to produce compared initial object images, and drawing the compared initial object images in the second frame image storage area while storing assigned distances of the compared initial object images from the virtual viewpoint;

subjecting the compared initial object images stored in the second frame image storage area to the predetermined image processing without being followed by the predetermined comparison processing to produce processed images; and

combining the processed images with the compared object images previously stored in the first frame image storage area to produce synthesized images.

16. The computer-readable recording medium according to Claim 15, wherein the image processing program performs, as the predetermined comparison processing, a process for comparing Z coordinate values expressing the assigned distances from the virtual viewpoint of a first group of pixels composing the object images and a second group of pixels composing the object images, the pixels in the first group of pixels each having first X-Y coordinate values in a two-dimensional plane, and the pixels in the second group of pixels each having second X-Y coordinate values in the

two-dimensional plane which are identical to the first X-Y coordinate values, for each X-Y coordinate value the predetermined comparison processing retaining only the pixel having a Z coordinate value closest to the virtual viewpoint, and omitting the pixel having a Z coordinate value which is not closest to the virtual viewpoint.

17. A computer-readable recording medium having recorded thereon an image processing program to be executed on a computer, the image processing program utilizing a first frame image storage area and a second frame image storage area for processing initial object images each having a coefficient of semi-transparency and an assigned distance from a virtual viewpoint, ones of the initial object images to be subjected to predetermined image processing, the image processing program comprising:

subjecting other ones of the initial object images not to be subjected to the predetermined image processing to predetermined comparison processing based on the assigned distances from the virtual viewpoint to produce first compared object images, and drawing the first compared object images in the first frame image storage area while storing assigned distances of the first compared object images from the virtual viewpoint;

subjecting the ones of the initial object images to the predetermined image processing to produce resultant object images;

subjecting the resultant object images to the

predetermined comparison processing to produce second compared object images, and then combining in the first frame image storage area the second compared object images with the first compared object images to produce first frame images without storing assigned distances of the first frame images from the virtual viewpoint;

separately subjecting the ones of the initial object images to the predetermined comparative processing but not to the predetermined image processing to produce compared initial object images, and then drawing the compared initial object images in the second frame image storage area while storing assigned distances of the compared initial object images from the virtual viewpoint;

subjecting the compared initial object images stored in the second frame image storage area to the predetermined image processing without being followed by the predetermined comparison processing to produce processed images; and

combining the processed images with the first frame images previously stored in the first frame image storage area to produce synthesized images.

18. The computer-readable recording medium according to Claim 17, wherein the image processing program performs, as the predetermined comparison processing, a process for comparing Z coordinate values expressing the assigned distances from the virtual viewpoint of a first group of pixels composing the object images and a second group of

pixels composing the object images, the pixels in the first group of pixels each having first X-Y coordinate values in a two-dimensional plane, and the pixels in the second group of pixels each having second X-Y coordinate values in the two-dimensional plane which are identical to the first X-Y coordinate values, for each X-Y coordinate value the predetermined comparison processing retaining only the pixel having a Z coordinate value closest to the virtual viewpoint, and omitting the pixel having a Z coordinate value which is not closest to the virtual viewpoint.

19. An image processing program for processing initial object images each having a coefficient of semi-transparency and an assigned distance from a virtual viewpoint, the image processing program comprising:

subjecting ones of the initial object images to predetermined image processing to produce resultant object images based on the coefficients of semi-transparency and the assigned distances from the virtual viewpoint so that the initial object image having an assigned distance closest to the virtual viewpoint is processed last.